

WHAT IS CLAIMED IS

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1. An AD converter, comprising:

a sample-&-hold circuit which samples and holds an input analog potential in a first period, and generates a signal indicative of a magnitude relation between the held input analog potential and a reference potential in a second period;

a plurality of amplifiers connected in series which amplify an output of said sample-&-hold circuit; and

a control circuit which controls operating timing of said amplifiers so as to make at least one of said amplifiers start operating in a middle of the first period.

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2. The AD converter as claimed in claim 1, further comprising switch circuits, each of which short-circuits an input and an output of a corresponding one of said amplifiers, wherein said control circuit closes said switch circuits in the first period to short-circuit the input and the output.

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3. The AD converter as claimed in claim 2, wherein said control circuit makes a specified amplifier start operating from a start of the first period, said specified amplifier being one of said

amplifiers that directly receives the output of said sample-&-hold circuit.

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4. The AD converter as claimed in claim 2, wherein said control circuit controls operating timing of said amplifiers such that a delay in a start of operation increases toward a tail end of the series of said amplifiers.

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5. The AD converter as claimed in claim 1, wherein said sample-&-hold circuit includes a plurality of condensers and a plurality of switches.

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6. The AD converter as claimed in claim 1, wherein said control circuit controls said sample-&-hold circuit such that said sample-&-hold circuit successively generates the signal indicative of a magnitude relation while changing the reference potential in the second period.

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7. The AD converter as claimed in claim 1, wherein said amplifiers are inverters.

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8. The AD converter as claimed in claim 1, wherein said amplifiers are differential amplification circuits.

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9. The AD converter as claimed in claim 1, wherein said amplifiers are configured such that a steady-state current flows in any one of said amplifiers when the one of said amplifiers operates in the first period.

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10. An AD converter, comprising:  
a sampling circuit which samples an input analog potential in a first period, and generates a signal responsive to the input analog potential in a second period;  
a plurality of amplifiers connected in series which amplify an output of said sampling circuit; and  
a control circuit which makes a current flow in at least one of said amplifiers only during a later portion of the first period.

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11. The AD converter as claimed in claim 10, further comprising switch circuits, each of which short-circuits an input and an output of a corresponding one of said amplifiers, wherein said control circuit closes said switch circuits in the

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first period to short-circuit the input and the output.

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12. The AD converter as claimed in claim 11, wherein said control circuit makes a specified amplifier start operating from a start of the first period, said specified amplifier being one of said amplifiers that directly receives the output of said sampling circuit.

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13. The AD converter as claimed in claim 11, wherein said control circuit controls operating timing of said amplifiers such that a delay in a start of operation increases toward a tail end of the series of said amplifiers.

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14. The AD converter as claimed in claim 10, wherein said sampling circuit includes a plurality of condensers and a plurality of switches.

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15. The AD converter as claimed in claim 10, wherein said control circuit controls said sampling circuit such that said sampling circuit successively generates the signal responsive to the input analog potential.

5           16. The AD converter as claimed in claim  
10, wherein said amplifiers are inverters.

10           17. The AD converter as claimed in claim  
10, wherein said amplifiers are differential  
amplification circuits.

15           18. The AD converter as claimed in claim  
10, wherein said amplifiers are configured such that  
20 a steady-state current flows in any one of said  
amplifiers when the one of said amplifiers operates  
in the first period.

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